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UNH Media Relations

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April 10, 2014

UNH Student Project Diverts Nitrogen-Rich Urine From Great Bay to Farm Fields

Four Seniors Urge Classmates to “Reduce, Reuse, Peecycle”



Business major Liz McCrary '14 and environmental engineering students Taylor Walter '14 and Alyson Packhem '14 want students to donate their nitrogen-rich urine for their senior capstone project. They're exploring ways to divert the urine from the wastewater treatment plant and use it for fertilizer. Credit: Mike Ross, UNH Photographic Services

DURHAM, N.H. – Every day, the wastewater treatment plant in Durham treats 10,000 gallons of urine, filtering out nitrogen that could harm the Great Bay Estuary into which the wastewater flows. And every year, farmers spend tens of thousands of dollars on nitrogen-laden fertilizer to boost the growing power of their crops.

This spring, four University of New Hampshire seniors are connecting the dots between treatment plants and actual plants with a project called Durham Urine Diversion & Recycle. Their senior capstone project brings a custom-built Porta-Potty dubbed the Peebus to campus on weekend nights to collect nitrogen-rich urine from well-hydrated college students, and to educate them to think beyond the flush.

“Everybody pees and nobody thinks about where your pee goes,” says project manager Taylor Walter, a senior environmental engineering major. “This is a feasibility study to see if people are accepting of the concept of urine diversion.”

Joining Walter on the project are environmental engineering majors Alyson Packhem and Adam Carignan and business major Liz McCrary. Nancy Kinner, UNH professor of environmental engineering, and Durham town engineer David Cedarholm '94G are mentoring the students, and two local farmers are partners in the project, which draws inspiration from the Rich Earth Institute of Brattleboro, Vt., a larger-scale urine reuse project.

Human urine comprises 80 percent of the nitrogen entering Durham's wastewater treatment plant, the students say. There, much of it is removed by state-of-the-art biological processing before entering the Great

Bay Estuary, where too much of the nutrient can fuel excess algae growth and upset the balance of the estuary by robbing it of oxygen.

Yet that same nitrogen makes urine a very productive fertilizer. Durham Urine Diversion & Recycle is exploring the dual goals of diverting nitrogen from the treatment plant and using pasteurized urine as a fertilizer for hay crops. Farmers Dorn Cox of Lee, a Ph.D. student at UNH, and Ray LaRoche of Durham are interested in testing the urine fertilizer on their hay fields.

“It takes eight gallons of water to transport one gallon of urine,” says Cedarholm. “People don’t realize that urine is actually a valuable resource.” In addition to mentoring the students, Cedarholm has supported the project from his budget.

During four weekends, starting March 20, the students have parked their Peebus at a well-traveled campus crossroad (a parking lot at the corner of Strafford and Garrison avenues) between 11 p.m. and 1:30 a.m. to solicit “donations.”

The response, they say, has been overwhelmingly positive, with more than 200 students visiting the Peebus each weekend. “We had a feeling it would catch on, and it has,” says Walter. They generated significant buzz through word of mouth, news articles, and on Twitter (@peebus2014). “I donated my nitrogen” stickers, printed with a yellow droplet, spread the word as they become the spring’s must-have fashion accessory in Durham bars.

After three weekends, the students have collected about 40 gallons of urine. They hope to bring the Peebus to major events like the outdoor concert SolarFest, Durham’s Memorial Day Parade, and even UNH’s commencement. The students acknowledge that they’re unlikely to collect the 1,000 gallons needed to fertilize one acre of hay crop, but they’re upbeat that they’ve hit their goal of helping a wide audience understand the complex environmental issues behind the flush.

The [University of New Hampshire](#), founded in 1866, is a world-class public research university with the feel of a New England liberal arts college. A land, sea, and space-grant university, UNH is the state’s flagship public institution, enrolling 12,300 undergraduate and 2,200 graduate students.

Watch a video about Durham Urine Diversion & Recycle: <http://youtu.be/nQRTGNUMffes>

Photograph available to download:

<http://www.unh.edu/news/releases/2014/04/images/peebus-4498.jpg>

Caption: Business major Liz McCrary ’14 and environmental engineering students Taylor Walter ’14 and Alyson Packhem ’14 want students to donate their nitrogen-rich urine for their senior capstone project. They’re exploring ways to divert the urine from the wastewater treatment plant and use it for fertilizer.

Credit: Mike Ross, UNH Photographic Services

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